
Citation:

Deighton, K and Hudson, J and Manley, AJ and Kaiseler, M and Patterson, LB and Rutherford, ZH and Swainson, M (2019) Effects of emotional intelligence and supportive text messages on academic outcomes in first year undergraduates. *Journal of Further and Higher Education*, 43 (4). pp. 494-507. ISSN 0309-877X DOI: <https://doi.org/10.1080/0309877X.2017.1377161>

Link to Leeds Beckett Repository record:

<https://eprints.leedsbeckett.ac.uk/id/eprint/4024/>

Document Version:

Article (Accepted Version)

The aim of the Leeds Beckett Repository is to provide open access to our research, as required by funder policies and permitted by publishers and copyright law.

The Leeds Beckett repository holds a wide range of publications, each of which has been checked for copyright and the relevant embargo period has been applied by the Research Services team.

We operate on a standard take-down policy. If you are the author or publisher of an output and you would like it removed from the repository, please [contact us](#) and we will investigate on a case-by-case basis.

Each thesis in the repository has been cleared where necessary by the author for third party copyright. If you would like a thesis to be removed from the repository or believe there is an issue with copyright, please contact us on openaccess@leedsbeckett.ac.uk and we will investigate on a case-by-case basis.

Effects of emotional intelligence and supportive text messages on academic outcomes in first year undergraduates

Kevin Deighton^a, Joanne Hudson^{a,b}, Andrew J. Manley^a, Mariana Kaiseler^a, Laurie B. Patterson^a, Zoe H. Rutherford^a and Michelle Swainson^a

^aInstitute for Sport, Physical Activity & Leisure, Leeds Beckett University, LS6 3QS, United Kingdom.

^bApplied Sports Technology, Exercise and Medicine Research Centre, Swansea University, SA1 8EN, United Kingdom.

Telephone numbers and email addresses

Kevin Deighton (+44 (0)113 812 3582; K.Deighton@leedsbeckett.ac.uk).

Joanne Hudson (+44 (0)1792 513162; Joanne.Hudson@swansea.ac.uk).

Andrew J. Manley (+44 (0)113 812 4717; A.J.Manley@leedsbeckett.ac.uk).

Mariana Kaiseler (+44 (0)113 812 4026; M.H.Kaiseler@leedsbeckett.ac.uk).

Laurie B. Patterson (+44 (0)113 812 4007; L.Patterson@leedsbeckett.ac.uk).

Zoe H. Rutherford (+44 (0)113 812 4021; Z.H.Rutherford@leedsbeckett.ac.uk).

Michelle Swainson (+44 (0)113 812 4010; M.Mellis@leedsbeckett.ac.uk).

Corresponding author: Dr Kevin Deighton, Institute for Sport Physical Activity & Leisure, Leeds Beckett University, Leeds, LS6 3QS, United Kingdom (phone: +44 (0)113 812 3582; email: K.Deighton@leedsbeckett.ac.uk).

Running head: Supportive intervention and student outcomes

Word count: 5876 words.

Abstract

An increase in the number of students entering higher education has intensified the need for targeted strategies to support a wider range of student requirements. Current research suggests that emotional intelligence (EI) may be associated with academic success, progression and retention in university students but the use of EI screening as a prospective measure of success requires further investigation. This study evaluates the utility of prospective EI screening to predict progression rates, mean grades, attendance and online engagement in a sample of first year undergraduate students enrolled on the same degree programme (n=358). A supportive text messaging intervention was employed during potentially stressful periods of the academic year in a subsection of participants (n=60) that demonstrated low total EI scores relative to the cohort. Results showed no effects of EI classification on progression rates, mean grades, attendance and online engagement (all $P > 0.418$). Alternatively, the text messaging intervention was associated with significant improvements compared with a matched control group for progression rates ($P = 0.027$), mean grades ($P = 0.026$) and attendance ($P = 0.007$). The frequency of access to the virtual learning environment also tended to be higher in the intervention group compared with the control group ($P = 0.059$). In conclusion, this study did not identify any benefits of EI screening as a prospective indicator of student success but provides encouraging indications that a text messaging support intervention could help to improve progression rates, mean grades, attendance and online engagement in first year undergraduate students. Further research is warranted to develop these proof-of-concept findings.

Key words: engagement; attendance; grades; progression, support; academic achievement

Introduction

The past two decades have witnessed a significant increase in the number of students entering higher education (HE) in the UK. This is demonstrated by the Higher Education Statistics Agency (HESA) who recorded a rise in the number of students enrolling for their first degree from 313,589 in 1996 to 542,575 in 2015 (HESA 1998, 2017). Such widening participation in HE has been maintained in recent years despite the majority of institutions increasing undergraduate tuition fees to £9000 per year and it appears that numbers will remain high for the foreseeable future. In this regard, the continued recruitment of a large number of undergraduate students has been encouraged by the relaxation of government controls over the number of students recruited by institutions, with the complete removal of government controls on recruitment in 2015 being associated with a further small rise of 3% for the number of first degree enrolments (HESA 2017). The increased diversity of university students that accompanies these increased student numbers is acknowledged to broaden the range of student support needs to maximise engagement, progression and academic success (Crozier et al. 2008; Harper & Quayle 2014).

The positive relationship between student engagement, retention and success during HE is well-established and has stimulated a growing focus for institutions to develop evidence-informed resources to enhance the engagement of university students (Thomas 2012; Trowler 2010). This focus has been particularly aimed at first year students due to the elevated risk of low levels of engagement with the learning environment and increased attrition in this cohort during the transition from school to university (Schneider 2010; Trotter & Roberts 2006). In addition to institutions shaping the HE context to facilitate academic engagement, a growing body of evidence has explored the influence of students' existing emotional and social competencies in aiding them in the transition into, and through, university-level study (Keefer et al. 2012; Richardson et al. 2012).

The definitions of academic achievement and academic success remain debated and these concepts are often used interchangeably within the research literature. Acknowledged definitions of student success are typically broad, as described by Kuh et al. (2006, p.5) as “academic achievement, engagement in educationally purposeful activities, satisfaction, acquisition of desired knowledge, skills and competencies, persistence, attainment of educational outcomes, and post-college performance”. The focus of EI research on student outcomes during their first year at university often precludes the assessment of post-college performance but instead focus on the mean grade achieved by students during an academic year and/or the progression rates of students to the subsequent year of study (Parker et al. 2004, 2005, 2006; Qualter et al. 2009). This also aligns with the findings of a recent literature review which identified that academic achievement is the most frequently used assessment of academic performance in previous research and that this was almost entirely measured as the grades achieved by the students (York et al. 2015). In accordance with the definition provided above, measures of progression and engagement were also frequently identified within the literature (York et al. 2015). The use of these most commonly employed assessment methods were prioritised in the present study to facilitate comparisons with previous research within the topic and due to the easily quantifiable and accessible nature of these data.

Emotional intelligence (EI) has generated significant attention as an explanatory variable for important life outcomes, including the extent to which students succeed and progress during their studies at university (Parker et al. 2011). The exact definition of EI and the most appropriate methods for assessing this construct remain highly debated, with some authors considering EI to be an ability-based measure (e.g., Mayer et al. 2008), while others have promoted EI as a trait-based measure (e.g., Petrides, Pita, & Kokkinaki 2007). In accordance with these perspectives, ability-based measures of EI focus on emotion-related cognitive skills, whereas trait-based measures of EI are assessed using self-report questionnaires, similar to

97 other personality variables. Although the broad and varied definitions of EI have attracted
98 criticism from some scholars (e.g., Locke 2005), both the ability and trait aspects of EI have
99 been linked with substantive outcome criteria. The focus of the current investigation will be on
100 trait EI due to the established relationship between trait EI and academic success in North
101 American universities (Parker et al. 2004, 2005). In this regard, high achieving first year
102 university students demonstrated greater self-reported EI scores on enrolment to university
103 compared with lower achieving students (Parker et al. 2004, 2005). These findings are based
104 on assessments using the EQ-i:S (Bar-On 2002) which comprises four broad EI dimensions of
105 intrapersonal, interpersonal, adaptability, and stress management. The subsequent validation
106 of these scales in undergraduate students (Parker et al. 2011) further supports this approach to
107 assessing EI, which may accordingly be defined as: “the interrelated emotional and social
108 competencies, skills and facilitators that determine how effectively we understand and
109 express ourselves, understand others and relate with them, and cope with daily demands”
110 (Bar-On 2006, p.3). The development of such self-report methods also allows for large cohorts
111 to be screened which may help to prospectively identify students with lower levels of EI upon
112 entry to university and enable targeted interventions to provide further support during their
113 studies.

114 In addition to maximising academic performance, screening students for EI at the beginning of
115 their university studies could also be beneficial for identifying students with an increased risk
116 of attrition to enable more targeted support interventions. In this regard, preliminary evidence
117 from individual UK and Canadian universities has demonstrated higher total self-reported EI
118 scores in students who progressed from the first to second year of university study compared
119 with students who withdrew from their respective degree programme (Parker et al. 2006;
120 Qualter et al. 2009). Although EI is likely to be only one aspect of a multitude of reasons for
121 differences between students’ progression and attrition rates, this represents an easily

quantified variable that can be targeted to improve student outcomes. When considering other factors that influence progression and attrition rates, it is widely acknowledged that the motivation and opportunity for students to succeed within education is considerably influenced by the context of an individual's personal and social circumstance (Cartney & Rouse 2006; Haggis 2004). Specifically, the extent to which students feel socially integrated and connected within the university environment is positively associated with student progression (Christo & Oyinlade 2015; Lockhart 2004; Wilcox et al. 2005). The socio-economic circumstances of students have also been shown to be predictive of progression and academic achievement as recently reported by Crawford (2014). This report evaluated English-domiciled students who attended any UK university for the first time at age 18 or 19 between 2004-05 and 2009-10, with each cohort including between 180,000 and 235,000 HE participants. The socio-economic background of students was established by combining individual and neighbourhood level data, with the findings demonstrating that students from the highest socio-economic quintile group were approximately 3.4 percentage points less likely to withdraw from their studies, 5.3 percentage points more likely to complete their degree and 3.7 percentage points more likely to graduate with a First or 2:1 degree classification than those from the lowest socio-economic quintile group. Similar degree completion rates and attrition differences between socio-economic groups have been reported in Australian universities which demonstrates the international relevance of this issue (Edwards & McMillan 2015). Although EI is the focus of the present study, further research should aim to develop interventions to support students in relation to these other predictors of progression and academic achievement.

Targeted interventions to support students with lower EI scores on entry to university are promising and have primarily focussed on peer-mentoring from older students at the university. In a Canadian university, this approach has been shown to reduce attrition in students who received peer-mentoring either during the summer break at the end of their first year of study

or throughout the full academic year (Philippi, Kristensen, and Taylor 2012). These beneficial effects were substantial with an attrition rate approximately 10% lower than a control group of students with similar EI scores that did not receive peer-mentoring. These findings have been further substantiated at a UK university where peer mentoring and the completion of activities to improve EI in students with low baseline scores increased retention rates by approximately 25% compared with a cohort that did not receive the intervention (Qualter et al. 2009).

The benefits of peer-mentoring for students with low EI scores is encouraging. However, it must be acknowledged that this intervention has resource implications regarding staffing and time commitments which may not be feasible for all institutions. Recent developments within the field of physical activity has demonstrated the utility of targeted text messages to increase participants' feelings of support and improve the continuation of increased physical activity levels in response to an exercise intervention (Kinnaefick, Thøgersen-Ntoumani, and Duda 2016). These findings demonstrate the potential application of a supportive, yet generic, text messaging intervention to improve persistence with a new behaviour within an unfamiliar environment. This has many similarities with the behavioural changes required for an effective transition and learner success in an unfamiliar HE environment (Briggs et al. 2012) and subsequently it seems feasible that similar interventions could also assist students during their transition to university and through their first year of study. This would also represent a cost-effective method to highlight the support that is available to students and encourage students to seek assistance if required.

The purpose of the present study was to further investigate the relationship between the EI scores of students on enrolment to university and measures of academic attainment, engagement and retention during their first year of study. From this sample, we also aimed to establish whether a text messaging intervention can improve student outcomes in those who demonstrated low EI scores on enrolment. This research will add to the limited understanding

of the relationship between EI scores and academic outcomes in UK universities, as well as evaluating the effectiveness of a novel low cost intervention to improve academic outcomes in students with low EI scores. In contrast to previous research, this study utilised a cohort of students that were enrolled on the same degree programme in the same year and who were required to complete the same six 20 credit modules for their first year of study. This novel population allowed further investigation into the role of EI on student outcomes without the confounding influence of students having different enrolment dates, studying different modules or studying for different degree programmes. We hypothesised that students with higher EI scores on enrolment would achieve higher grades and have higher levels of engagement and retention than students with lower EI scores. We also hypothesised that the provision of supportive text messages would improve academic attainment, engagement and retention in those students with low EI scores on enrolment.

Materials and methods

Participants

All first year BSc Sport & Exercise Science students at the same university in the UK were invited to participate in the study in October 2015. From the cohort of 420 students, 358 students provided written informed consent for their data to be used within the study. All participants would be expected to graduate from their three year degree programme in 2018. To ensure that students did not feel coerced into giving consent, they were informed that student IDs would be used to store data and to track student activity and engagement with support and Virtual Learning Environment (VLE) services. Ethical approval for the study was granted by the Faculty Local Research Ethics Committee.

195 ***Context***

196 This research was embedded within one of the six compulsory 20 credit first year modules on
197 the BSc Sport & Exercise Science course titled ‘Introduction to Research and Study Skills’
198 (IRSS). The module spanned both semesters and focused on developing academic and study
199 skills in semester one, while providing an introduction to research methods and data analysis
200 in semester two. The module structure included biweekly keynote lectures and weekly seminars
201 delivered to each group by their personal tutor. Each tutor group contained approximately 20
202 students and there were 20 tutor groups for the cohort (groups A-T). Staff teaching on the
203 module were briefed about the research study and its use as a stimulus for students’ personal
204 reflection and planning during the IRSS module.

205 ***Procedures***

206 *Emotional Intelligence Profiling*

207 During the first week of semester one, all participants completed an online version of the EQ-
208 i:S (Bar-On 2002) during their IRSS seminar session. Based on its factor structure and
209 associations with conceptually similar measures (ability-based EI and alexithymia), Parker et
210 al. (2011) have demonstrated the conceptual and theoretical integrity and the discriminant and
211 convergent validity of the EQ-i:S.. For total EI scores and individual subscales, test-retest
212 correlation coefficients, obtained from administrations six months apart, of 0.60 and above
213 supported its temporal reliability, and, Cronbach’s alpha values over 0.75 indicated the
214 measure’s internal reliability. This measure has been associated with academic success and
215 retention in universities in North America (Parker et al. 2004, 2005, 2006).

216 The EQ-i:S includes 51 items that represent six subscales, four of which were used to determine
217 a total EI score in accordance with previous research (Keefer et al. 2012). These four subscales
218 (comprising 35 items) were used in the current study and are as follows: Interpersonal skills

(10 items assessing social awareness and ability to establish and be part of social relationships); Intrapersonal skills (10 items assessing self-awareness and the ability to recognise and effectively manage one's self-expression); Stress management (8 items assessing the ability to manage and regulate emotions); and Adaptability (7 items measuring the ability to adapt to change and solve personal and interpersonal problems).

Example items from each subscale are: 'I like helping people' (Interpersonal); 'I'm unable to express my ideas to others' (Intrapersonal; reverse scored item); 'It is a problem controlling my anger' (Stress Management; reverse scored item); 'My approach in overcoming difficulties is to move step by step' (Adaptability). Respondents indicate their responses using a 5-point Likert scale anchored by 1 (*Very seldom true of me*) and 5 (*Very often true of me*).

Students confidentially received their individual EQ-i:S results during the fourth IRSS seminar in semester one. This session also provided an explanation of the concept of emotional and social skills, the different elements that the scores on the EQ-i:S represented, and evidence supporting the link between emotional intelligence and outcomes in academia. Students were encouraged to consider the relevance of these skills to help them manage the transition to university and to reflect on their personal profiles to establish areas of strength and areas for improvement. It is important to note that the entire cohort for the degree programme completed the EQ-i:S and attended the feedback session as part of the IRSS module provision but data was only used in the present study for those who provided consent.

Group Allocation

The participants were separated into thirds based on their total EQ-i:S scores (i.e. highest, middle and lowest thirds). Students in the lowest third for EQ-i:S scores were selected for the intervention based on evidence that lower scores increase the risk for attrition and lower academic performance (Parker et al. 2004, 2006), therefore suggesting that these students may

benefit most from the intervention. To robustly investigate the effects of the intervention, students in the lowest third were quasi-randomised into either a control or intervention group based on their tutor group. In this regard, those in the lowest third in tutor groups A-J received the intervention, while those in the lowest third in tutor groups K-T acted as control participants without any intervention. The assignment of these students to a non-intervention control group enabled accurate assessment of the text messaging intervention but also provided the opportunity to investigate the relationship between EI scores and student outcomes without there being any contamination of the data from the intervention. In this regard, the 168 students from tutor groups K-T provided a large sample of students to accurately assess differences in student success outcomes across the different EI tertiles without any intervention. The control and intervention groups were matched for EQ-i:S scores (mean (SD); Intervention: 103 (4); Non-intervention: 103 (5)) and 60 participants were included in each group.

Intervention

Participants in the intervention group received three text messages from the Faculty Student Liaison Officer (SLO) at pre-identified time points throughout the year. These time points represented potentially stressful periods for the students and were as follows: November 2015 (prior to the semester one assessment period); February 2016 (the beginning of semester two and at the time of results feedback from semester one); and April 2016 (prior to the assessment period for semester two). The text message reminded students of the pastoral, academic and personal support that was available within the faculty and the university with a hyperlink to details about these services. The message also invited students to 'drop-in' or make an appointment to see an SLO using the hyperlink provided. Messages were tailored to match the time of year at which they were sent, for instance, referring to preparing for examinations, considering assessment results and preparing for the upcoming semester. Although these

services were available to all students within the faculty, the intervention highlighted the availability of the services and made an explicit offer for the students to use this support.

Monitoring of Outcomes

Attendance registers were collected during all seminar sessions for the IRSS module and collated at the end of the academic year. The number of times that the participants accessed the IRSS module content on the VLE was also monitored and collated throughout the year as a marker of student engagement. The mean grade achieved by the participants for their first year modules and the successful completion of first year studies for progression to the second year of the degree programme were obtained from the annual examination board statistics. Progression to the second year of the degree required a mean grade of 40% or higher for the first year modules, with a minimum grade of 40% in five modules and a minimum grade of 30% in the remaining one module.

Data Analysis

Data were analysed using IBM SPSS statistics version 22 for Windows and all data are presented as mean (SD). Participants were divided into tertiles based on their ranked total EI score to produce highest, middle and lowest thirds. The threshold values for each third were calculated based on the scores from the entire cohort of the degree programme. Where the threshold value for each third contained multiple participants all participants were retained within the relevant third.

One-way ANOVA with post-hoc independent samples t-tests was used to assess differences between tertiles for EI subscales, attendance, VLE access and the mean grade achieved during the year. Differences between the intervention and non-intervention groups for attendance, VLE access and the mean grade achieved during the year were assessed using independent samples t-tests. Progression and withdrawal data were entered in binary form and compared

between tertiles and between the intervention and non-intervention groups using the Chi-squared test. Statistical significance for this study was accepted as $P < 0.05$.

Results

Baseline data

Total EI scores for the A-J and K-T tutor groups were comparable at baseline (Highest third: 122 (6) vs. 125 (6); Middle third: 112 (2) vs. 113 (2); Lowest third: 103 (4) vs. 103 (5) for the A-J and K-T tutor groups, respectively). The number of students in the A-J and K-T tutor groups was also similar at baseline (Highest third: 53 vs. 50; Middle third: 77 vs. 58; Lowest third: 60 vs. 60 for the A-J and K-T tutor groups, respectively). The scores for each subscale of the EQ-i:S were significantly different between tertiles in accordance with the total EI scores (all $P < 0.0005$; Table 1).

Progression rates

Chi-squared test revealed a trend towards a difference in progression rates to the second year of the degree programme between tertiles when assessed as an entire cohort. This indicated higher progression rates in the lowest third than the highest and middle thirds ($P = 0.077$; Highest third: 67%; Middle third: 67%; Lowest third: 78%; Figure 1a). This trend was consistent within tutor groups A-J ($P = 0.092$; Highest third: 72%; Middle third: 73%; Lowest third: 87%; Figure 1c) but not tutor groups K-T ($P = 0.419$; Highest third: 62%; Middle third: 59%; Lowest third: 70%; Figure 1d). This difference appears to be the result of higher progression rates in the intervention group (i.e., the lowest third of tutor groups A-J) compared with the non-intervention group (i.e., the lowest third of tutor groups K-T) ($P = 0.027$; Intervention: 87%; Non-intervention: 70%; Figure 1b).

The number of students that withdrew from the degree programme before the end of the academic year was not different between tertiles ($P = 0.490$; Highest third: 7 students; Middle third: 13 students; Lowest third: 7 students). There was also no difference between tertiles in the number of withdrawals for tutor groups A-J ($P = 0.610$) or K-T ($P = 0.381$), or between intervention and non-intervention groups ($P = 0.697$).

Mean grade

One-way ANOVA revealed no significant difference in mean grade between tertiles when assessed as an entire cohort ($P = 0.129$; Figure 2a). Alternatively, mean grade was significantly different between tertiles for tutor groups A-J ($P = 0.032$), with post-hoc analysis demonstrating significantly higher grades in the lowest third compared with the highest third ($P = 0.010$) and a trend for higher grades in the lowest third compared with the middle third ($P = 0.087$) (Figure 2c). There was no difference between tertiles for tutor groups K-T ($P = 0.678$; Figure 2d). These contrasting findings appear to be the result of higher mean grades in the intervention group compared with the non-intervention group ($P = 0.026$; Figure 2b).

Attendance

One-way ANOVA revealed no significant difference in attendance between tertiles when assessed as an entire cohort ($P = 0.375$; Figure 3a), tutor groups A-J ($P = 0.490$; Figure 3c) or tutor groups K-T ($P = 0.885$; Figure 3d). Attendance was significantly higher in the intervention group than the non-intervention group ($P = 0.007$; Figure 3b).

VLE access

One-way ANOVA revealed no significant difference in the frequency of VLE access between tertiles when assessed as an entire cohort ($P = 0.652$; Figure 4a), tutor groups A-J ($P = 0.935$; Figure 4c) or tutor groups K-T ($P = 0.500$; Figure 4d). There was a trend towards a higher

frequency of VLE access in the intervention group compared with the non-intervention group
($P = 0.059$; Figure 4b).

Discussion

Higher education institutions typically rely on personal tutoring programmes to provide both academic and pastoral support to students. However, there is a need to adopt additional strategies to support students during their transition to a university learning environment and to retain students in accordance with the UK performance indicators of HE (HESA 2016; Pollard et al. 2013). Although recent research has used EI screening as a tool to identify students that may require additional support during the transition to university (Philippi, Kristensen, and Taylor 2012; Qualter et al. 2009), the present study did not observe any association between EI scores and academic performance or progression rates in a cohort of first year undergraduate students. However, this study did demonstrate improved outcomes for a subsection of the participants that received a targeted text messaging support intervention.

In addition to investigating the effects of a supportive text messaging intervention, the present study design enabled further exploration of the relationship between EI and progression rates, achieved mean grade, attendance and VLE access in first year undergraduate students. This was achieved through the use of a control group for students within the lowest third of total EI scores who were in tutor groups K-T. Subsequently, the lack of any intervention for the 168 students in tutor groups K-T across all EI tertiles provided the opportunity to investigate these relationships without any contamination from experimental interventions. Our findings demonstrated that progression rates, achieved mean grade, attendance and VLE access did not significantly differ across the three tertiles of EI. These results do not appear to support the notion suggested by others that higher emotional intelligence is associated with greater

likelihood to progress (Parker et al. 2006; Qualter et al. 2009), higher academic attainment (Parker et al. 2004, 2005; Pope, Roper, and Qualter 2012) and greater engagement with learning (Arguedas, Daradoumis, and Xhafa 2016). One potential explanation for such conflicting results is the method of data analysis performed within the studies. In this regard, positive associations between EI and academic outcomes have typically been observed via retrospective analysis of EI scores after the participants have been separated into categories of academic achievement or progression at the end of the monitoring period (Parker et al. 2004, 2005, 2006; Pope, Roper, and Qualter 2012; Qualter et al. 2009). In contrast, the purpose of the present study was to evaluate the effectiveness of EI screening as a *prospective* measure to identify students that might benefit from additional support during their first year at university. The categorisation of participants into tertiles based on total EI scores follows a similar approach to Qualter et al. (2009) who also failed to observe a relationship between EI and progression rates when participants were prospectively categorised.

A particularly novel aspect of the present study was the targeted provision of a text messaging intervention to raise students' awareness of university support services at key time points during the academic year. Although the present study may be regarded as a pilot intervention, the initial results are encouraging. In this regard, compared with a matched control group, the students receiving the intervention demonstrated significantly higher progression rates, higher mean grades, higher attendance, and a trend towards greater VLE access. These seemingly beneficial effects occurred despite the absence of any responses from the intervention group to seek appointments with the Student Liaison Officer after receiving the text messages. The reasons for students not responding to the offered support are unknown but their reluctance to engage with support services corresponds with previous literature. In this regard, university students have shown significant heterogeneity in their support seeking behaviours, with students commonly not seeking help for academic (Ryan et al. 1998), counselling (Morgan et

al. 2003) career guidance (Graef et al. 2010), and mental health support (Eisenberg et al. 2007) even when the help is available and required. Findings specifically from UK universities highlight that many students do not seek support even when experiencing a problem (Christie et al. 2004), which is particularly concerning based on data from more than 450 campus-based and open university students that all students within this sample reported some difficulty when entering HE (Gutteridge 2001). In the present study we attempted to reduce the barriers to support seeking by directly reminding students of the support available within the university. Further investigation of the reasons underlying the lack of help seeking behaviours was beyond the scope of this study but represents an important avenue for future research to establish how to develop future support mechanisms that are most appropriate for the student population.

Although the text messaging intervention did not promote help seeking behaviours from the students, it seems feasible that the receipt of the text messages alone may have benefitted the students. This effect is supported by previous evidence that a text messaging intervention increased participant perceptions of support and persistence with new behaviours in a physical activity setting (Kinnafick, Thøgersen-Ntoumani, and Duda 2016). Furthermore, in a sports performance context the mere perception of support has been shown to evoke an increased sense of confidence and reassurance coupled with a reduction in stress and anxiety (Freeman and Rees 2010). These findings suggest that an increased perception of support may have been gained from the text messaging intervention to help students cope and persist with the demands of an unfamiliar HE environment. The observed improvements in progression rates may be particularly relevant for HE institutions in the UK considering the increased focus on student retention as a key marker of success for universities and the need for high retention rates to fulfil financial aims via the income generated from tuition fees (Bennett, Kottasz, and Nocciolino 2007; Owen 2002; Simpson 2005). Retention is also important to maximise the prospects of enrolled students based on evidence that compared with non-graduates, university

graduates lead healthier lifestyles (Baum, Ma, and Payea 2013) and experience better outcomes in both lifetime earnings and employability (Day and Newburger 2002; Universities UK 2014). However, further research is required to substantiate the findings of the present study and to assess student perceptions of support in response to this form of intervention.

The findings from the present study provide a number of implications and future directions for both research and practice that require consideration. First, considering the novelty of the text messaging intervention within this context, it is crucial that further research is performed to investigate similar time- and cost-effective interventions to improve student outcomes in a larger sample of students and across a range of institutions. It must also be acknowledged that EI is considered to be a dynamic construct with the potential to fluctuate over the course of a student's experiences within HE (Parker et al. 2004). Subsequently, the findings of the present study may be limited by the assessment of EI at a single baseline time point and future research may benefit from the longitudinal assessment of EI and its association with relevant outcomes throughout university degree programmes. Second, future research should also consider the most appropriate outcomes to assess as a measure of student engagement. Although the present study used the most appropriate proxy measurements for student engagement (attendance and VLE access), a more targeted and comprehensive investigation is required in future research to examine the qualitative aspects of this concept (Kuh 2009). Third, EI was assessed in the present study using a validated and reliable EI questionnaire (Parker et al. 2011) in order to screen a large cohort of students with limited resources. This method successfully differentiated the EI of students and provided further insights into the relationship between EI and student success outcomes, as well as enabling our investigation into the effects of a text messaging intervention for those students with the lowest EI scores on entry to university. The quantitative findings gained from the present study provide important insights into the potential utility of prospective EI screening as a predictor of student success. These findings have also

demonstrated the potential benefits of supportive text messaging to improve student outcomes.

It would be beneficial for future research to develop these findings through the addition of

qualitative data to better understand optimal support interventions and for the development of

other novel or adapted approaches to support the diverse needs of university students.

An additional fundamental consideration in relation to the present study is that the definition

of academic success and achievement remains a debated topic and we did not assess all aspects

of this concept. In this regard, a recent review has suggested that additional aspects beyond

those assessed in the present study should be considered when measuring academic

achievement (York et al. 2015). This includes distinctly assessing the attainment of learning

objectives and the acquisition of desired skills and competencies of students during their degree

programme as a marker of learning rather than focussing solely on performance ability. Student

satisfaction has also been considered as an outcome for student success based on the

acknowledged relationship between student wellbeing and academic performance (Beghetto

2004; York et al. 2015), and ultimately the post-college performance of students should be

integrated within measures of academic success (York et al. 2015). Subsequently, although the

present study measured the most commonly used markers of academic success, it must be

acknowledged that this provided relatively narrow criteria for academic success and it would

be beneficial for future research to evaluate the effectiveness of support interventions on

student success when measured more holistically.

Despite these limitations, we can state with confidence that the participants did not respond

adversely to the intervention performed in the present study and the observed positive effects

associated with such a low-cost initiative suggests that staff within HE environments may be

in a position to harness novel time- and cost-effective support mechanisms to benefit student

outcomes. It must also be considered that this approach could be used in conjunction with,

rather than as a replacement for, peer-mentoring schemes if these are already established within

institutions. Such use of multiple student support initiatives may be beneficial considering that peer-support networks have been advocated as a useful intervention for students in HE but that an optimal approach has not yet been established (Crisp and Cruz 2009).

In conclusion, this study did not identify any benefits of EI screening as a prospective indicator of student success but provides encouraging indications that a text messaging support intervention could help to improve attendance, mean grades and progression rates in first year undergraduate students. Considering the novel nature of the intervention within this context, these conclusions should be viewed as tentative, with further research warranted before they are used as the basis for interventions being developed and implemented with student cohorts on a wider scale. The authors of the present study recommend that colleagues at other institutions consider opportunities for conducting additional studies that employ more prolonged and intensive investigations to further investigate these proof-of-concept findings.

Acknowledgements

We would to thanks all of the staff who facilitated the completion of emotional intelligence profiling during their IRSS seminar sessions. We would also like to thank the Student Liaison Officers for their assistance with the project and Martin Pemberton for his assistance with the administration of outcome monitoring.

Conflict of interest

The authors declare that there are no conflicts of interest.

References

- Arguedas, M., T. Daradoumis, and F. Xhafa. 2016. "Analyzing How Emotion Awareness Influences Students' Motivation, Engagement, Self-Regulation and Learning Outcome." *Educational Technology & Society* 19 (2): 87–103.
- Bar-On, R. 2002. *Bar-On Emotional Quotient Inventory: Short (EQ-i:S): Technical Manual*. Toronto, ON, Canada: Multi-Health Systems.
- Bar-On, R. 2006. "The Bar-On Model of Emotional-Social Intelligence (ESI)." *Psicothema* 18: 13-25.
- Baum, S., J. Ma, and K. Payea. 2013. *Education Pays 2013: The Benefits of Higher Education for Individuals and Society*.
<http://trends.collegeboard.org/sites/default/files/education-pays-2013-full-report.pdf>.
- Beghetto, R. A. 2004. "Toward a More Complete Picture of Student Learning: Assessing Students' Motivational Beliefs." *Practical Assessment, Research & Evaluation* 9 (15): 1-5.
- Bennett, R., R. Kottasz, and J. Nocciolino. 2007. "Catching the Early Walker: An Examination of Potential Antecedents of Rapid Student Exit from Business-Related Undergraduate Degree Programmes in a Post-1992 University." *Journal of Further and Higher Education* 31 (2): 109–32.
- Briggs, A. R. J., J. Clark, and I. Hall. 2012. "Building Bridges: Understanding Student Transition to University." *Quality in Higher Education* 18 (1): 3-21.

500 Cartney, P., and A. Rouse. 2006. "The Emotional Impact of Learning in Small Groups:
501 Highlighting the Impact on Student Progression and Retention." *Teaching in Higher*
502 *Education* 11 (1): 79-91.

503 Christie, H., M. Munro, and T. Fisher. 2004. "Leaving University Early: Exploring the
504 Differences Between Continuing and Non-Continuing Students." *Studies in Higher*
505 *Education* 29 (5): 617-36.

506 Christo, Z, and A. Oyinlade. 2015. "Factors of Student Attrition at an Urban University."
507 *International Journal of Humanities and Social Science* 5 (9): 1.

508 Crawford, C. 2014. "Socio-Economic Differences in University Outcomes in the UK: Drop-
509 Out, Degree Completion and Degree Class." *Institute for Fiscal Studies*, DOI
510 10.1920/wp.ifs.2014.1431.

511 Crisp, G., and I. Cruz. 2009. "Mentoring College Students: A Critical Review of the
512 Literature between 1990 and 2007." *Research in Higher Education* 50 (6): 525–45.

513 Crozier, G., D. Reay, J. Clayton, L. Colliander, and J. Grinstead. 2008. " Different strokes for
514 different folks: diverse students in diverse institutions – experiences of higher education."
515 *Research Papers in Education* 23 (2): 167-77.

516 Day, J. C., and E. C. Newburger. 2002. *The Big Payoff: Educational Attainment and*
517 *Synthetic Estimates of Work-Life Earnings*. [http://www.census.gov/prod/2002pubs/p23-](http://www.census.gov/prod/2002pubs/p23-210.pdf)
518 [210.pdf](http://www.census.gov/prod/2002pubs/p23-210.pdf).

519 Edwards, D., and J. McMillan. 2015. "Completing University in a Growing Sector: Is Equity
520 an Issue?" Retrived from:

521 http://research.acer.edu.au/cgi/viewcontent.cgi?article=1045&context=higher_education
522 (accessed 19.07.17).

523 Eisenberg, D., E. Golberstein, and S. E. Gollust. 2007. "Help-Seeking and Access to Mental
524 Health Care in a University Student Population." *Medical Care* 45 (7): 594-601.

525 Freeman, P., and T. Rees. 2010. "Perceived Social Support from Team-Mates: Direct and
526 Stress-Buffering Effects on Self-Confidence." *European Journal of Sport Science* 10 (1): 59–
527 67.

528 Graef, S. T., D. M. Tokar, and K. P. Kaut. 2010. "Relations of Masculinity Ideology,
529 Conformity to Masculine Role Norms, and Masculine Gender Role Conflict to Men's
530 Attitudes Toward and Willingness to Seek Career Counseling." *Psychology of Men &*
531 *Masculinity* 11 (4): 319-33.

532 Gutteridge, R. 2001. "Student Support, Guidance and Retention; Re-Defining Additional
533 Needs." Retrived from: <http://www.leeds.ac.uk/educol/documents/00001709.htm> (accessed
534 19.07.17).

535 Haggis, T. 2004. "Meaning, Identity and 'Motivation': Expanding What Matters in
536 Understanding Learning in Higher Education?" *Studies in Higher Education* 29 (3): 335-52.

537 Harper, Shaun R., and Stephen J. Quaye. 2014. "Making Engagement Equitable for Students
538 in U.S. Higher Education." In *Student Engagement in Higher Education: Theoretical*
539 *Perspectives and Practical Approaches for Diverse Populations*, edited by Stephen J. Quaye
540 and Shaun R. Harper, 1-15. Abingdon: Routledge.

541 HESA. 1996. *Higher Education Statistics for the United Kingdom 1996/97*.
542 <https://www.hesa.ac.uk/data-and-analysis/students/overviews?keyword=All&year=547>.

543 HESA. 2016. *Summary - UK Performance Indicators 2014/15*. [https://www.hesa.ac.uk/data-](https://www.hesa.ac.uk/data-and-analysis/performance-indicators/summary)
544 *and-analysis/performance-indicators/summary*.

545 HESA. 2017. *Higher education student enrolments and qualifications obtained at higher*
546 *education providers in the United Kingdom 2015/16*. [https://www.hesa.ac.uk/news/12-01-](https://www.hesa.ac.uk/news/12-01-2017/sfr242-student-enrolments-and-qualifications)
547 *2017/sfr242-student-enrolments-and-qualifications*.

548 Keefer, K. V., J. D. A. Parker, and L. M. Wood. 2012. "Trait Emotional Intelligence and
549 University Graduation Outcomes: Using Latent Profile Analysis to Identify Students at Risk
550 for Degree Noncompletion." *Journal of Psychoeducational Assessment* 30 (4): 402-13.

551 Kinnaifick, F. E., C. Thøgersen-Ntoumani, and J. Duda. 2016. "The Effect of Need
552 Supportive Text Messages on Motivation and Physical Activity Behaviour." *Journal of*
553 *Behavioral Medicine* 39 (4): 574–86.

554 Kuh, G. D. 2009. "What Student Affairs Professionals Need to Know about Student
555 Engagement." *Journal of College Student Development* 50 (6): 683–706.

556 Kuh, G. D., J. Kinzie, J. A. Buckley, B. K. Bridges, and J. C. Hayek. 2006. "What Matters to
557 Student Success: A Review of the Literature." Retrieved from:
558 https://nces.ed.gov/npec/pdf/kuh_team_report.pdf (accessed 19.07.17).

559 Locke, E. A. 2005. "Why Emotional Intelligence is an Invalid Concept." *Journal of*
560 *Organizational Behaviour* 26 (4): 425-31.

561 Lockhart, P. 2004. "An Investigation into the Causes of Student Drop Out Behaviour."
562 Retrieved from: <http://www.psy.gla.ac.uk/~steve/localed/docs/lockhart.pdf> (accessed
563 19.07.17).

564 Mayer, J. D., P. Salovey, and D. R. Caruso. 2008. "Emotional Intelligence: New Ability or
565 Eclectic Traits?" *American Psychologist* 63 (6): 503-17.

566 Morgan, T., D. Ness, and M. Robinson. 2003. "Students' Help-Seeking Behaviours by
567 Gender, Racial Background, and Student Status." *Canadian Journal of Counselling* 37 (2):
568 151-66.

569 Owen, M. 2002. "'Sometimes You Feel You're in Niche Time': The Personal Tutor System,
570 a Case Study." *Active Learning in Higher Education* 3 (1): 7-23.

571 Parker, J. D. A., J. M. Duffy, L. M. Wood, B. J. Bond, and M. J. Hogan. 2005. "Academic
572 Achievement and Emotional Intelligence: Predicting the Successful Transition from High
573 School to University." *Journal of The First-Year Experience* 17 (1): 67-78.

574 Parker, J. D. A., M. J. Hogan, J. M. Eastabrook, A. Oke, and L. M. Wood. 2006. "Emotional
575 Intelligence and Student Retention: Predicting the Successful Transition from High School to
576 University." *Personality and Individual Differences* 41 (7): 1329-36.

577 Parker, J. D. A., K. V. Keefer, and L. M. Wood. 2011. "Toward a Brief Multidimensional
578 Assessment of Emotional Intelligence: Psychometric Properties of the Emotional Quotient
579 Inventory-Short Form." *Psychological Assessment* 23 (3): 762-77.

580 Parker, J. D. A., L. J. Summerfeldt, M. J. Hogan, and S. A. Majeski. 2004. "Emotional
581 Intelligence and Academic Success: Examining the Transition from High School to
582 University." *Personality and Individual Differences* 36 (1): 163-72.

583 Petrides, K. V., R. Pita, and F. Kokkinaki. 2007. "The Location of Trait Emotional
584 Intelligence in Personality Factor Space." *British Journal of Psychology* 98 (2): 273-89.

585 Philippi, W. A., H. A. Kristensen, and R. N. Taylor. 2012. "Students at Risk for Dropping
 586 Out : Multi-Year Results of Two Student Mentoring Programs," Trent University.

587 Pollard, E., M. Williams, J. Williams, C. Bertram, and J. Buzzeeo. 2013. *How Should We*
 588 *Measure Higher Education? A Fundamental Review of the Performance Indicators. Part*
 589 *Two: The Evidence Report.*
 590 <http://www.hefce.ac.uk/media/hefce/content/pubs/indirreports/2013/Fundamental,review,of,t>
 591 [he,UKPIs/2013_ukpireview2.pdf.](http://www.hefce.ac.uk/media/hefce/content/pubs/indirreports/2013/Fundamental,review,of,t)

592 Pope, D., C. Roper, and P. Qualter. 2012. "The Influence of Emotional Intelligence on
 593 Academic Progress and Achievement in UK University Students." *Assessment & Evaluation*
 594 *in Higher Education* 37 (8): 907–18.

595 Qualter, P., H. Whiteley, A. Morley, and H. Dudiak. 2009. "The Role of Emotional
 596 Intelligence in the Decision to Persist with Academic Studies in HE." *Research in Post-*
 597 *Compulsory Education* 14 (3): 219–31.

598 Richardson, M., C. Abraham, and R. Bond. 2012. " Psychological Correlates of University
 599 Students' Academic Performance: A Systematic Review and Meta-Analysis." *Psychological*
 600 *Bulletin* 138 (2): 353-87.

601 Ryan, A. M., M. H. Gheen, and C. Midgley. 1998. "Why do Some Students Avoid Asking for
 602 Help? An Examination of the Interplay Among Students' Academic Efficacy, Teachers'
 603 Social-Emotional Role, and the Classroom Goal Structure." *Journal of Educational*
 604 *Psychology* 90 (3): 528–35.

605 Schneider, M. 2010. "Finishing the First Lap: The Cost of First Year Student Attrition in
 606 America's Four Year Colleges and Universities." *American Institutes for Research*.
 607 http://www.air.org/sites/default/files/AIR_Schneider_Finishing_the_First_Lap_Oct101.pdf.

608 Simpson, O. 2005. "The Costs and Benefits of Student Retention for Students, Institutions
 609 and Governments." *Studies in Learning, Evaluation Innovation and Development* 2 (3): 34–
 610 43.

611 Thomas, L. 2012. *Building Student Engagement and Belonging in Higher Education at a*
 612 *Time of Change: Final Report from the What Works? Student Retention & Success*
 613 *Programme*. https://www.heacademy.ac.uk/system/files/what_works_final_report_0.pdf.

614 Trotter, E, and C. A. Roberts. 2006. "Enhancing the Early Student Experience." *Higher*
 615 *Education Research & Development* 25 (4): 371–86.

616 Trowler, V. 2010. *Student Engagement Literature Review*.
 617 https://www.heacademy.ac.uk/system/files/studentengagementliteraturereview_1.pdf.

618 Universities UK. 2014. *Patterns and Trends in UK Higher Education*.
 619 [http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2014/patterns-and-](http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2014/patterns-and-trends-in-uk-higher-education-2014.pdf)
 620 [trends-in-uk-higher-education-2014.pdf](http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2014/patterns-and-trends-in-uk-higher-education-2014.pdf).

621 Wilcox, P., S. Winn, and M. Fyvie-Gauld. 2005. "It was Nothing to do with the University, it
 622 was just the People': The Role of Social Support in the First-Year Experience of Higher
 623 Education." *Studies in Higher Education* 30 (6): 707-22.

624 York, T. T., C. Gibson, and S. Rankin. 2015. "Defining and Measuring Academic Success."
 625 *Practical Assessment, Research & Evaluation* 20 (5): 1-20.

626 **Table 1.** Scores for each subscale of the EQ-i:S in each tertile.

	Highest third	Middle third	Lowest third	P
Interpersonal skills	41 (3)	40 (3)	38 (4)	<0.0005
Intrapersonal skills	27 (5)	23 (4)	19 (4)	<0.0005
Stress management	28 (5)	24 (4)	22 (3)	<0.0005
Adaptability	27 (4)	26 (3)	24 (4)	<0.0005

627
628 Values are mean (SD). P-values were determined using one-way ANOVA.

629

630

631

632

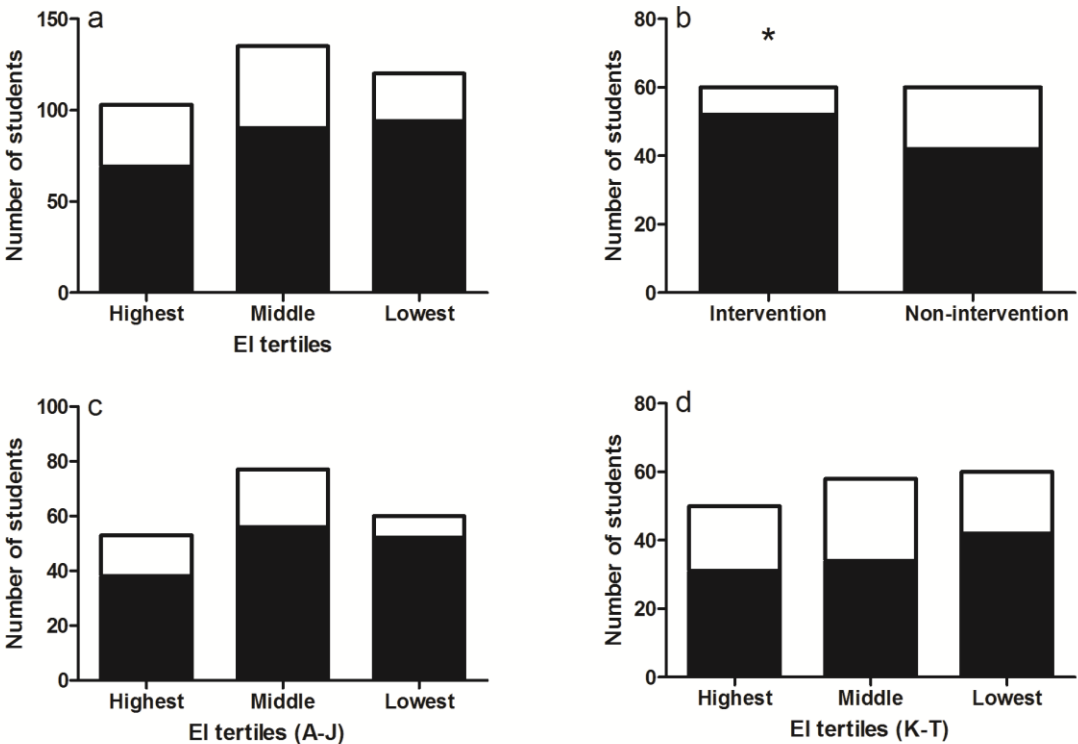
Figure 1. Progression rates from the first to second year of study for the entire cohort (a), the intervention and non-intervention groups (b), tutor groups A-J (c) and tutor groups K-T (d). Black bars represent the number of progressing students and the white bars represent the number of non-progressing students. *Significantly different between intervention and non-intervention groups.

Figure 2. Mean grade achieved during the first year of study for the entire cohort (a), the intervention and non-intervention groups (b), tutor groups A-J (c) and tutor groups K-T (d). *Significantly different between intervention and non-intervention groups. #Significantly higher in the lowest third than the highest third. Values are mean (SD).

Figure 3. Seminar attendance within the IRSS module for the entire cohort (a), the intervention and non-intervention groups (b), tutor groups A-J (c) and tutor groups K-T (d). *Significantly different between intervention and non-intervention groups. Values are mean (SD).

Figure 4. VLE access within the IRSS module for the entire cohort (a), the intervention and non-intervention groups (b), tutor groups A-J (c) and tutor groups K-T (d). Values are mean (SD).

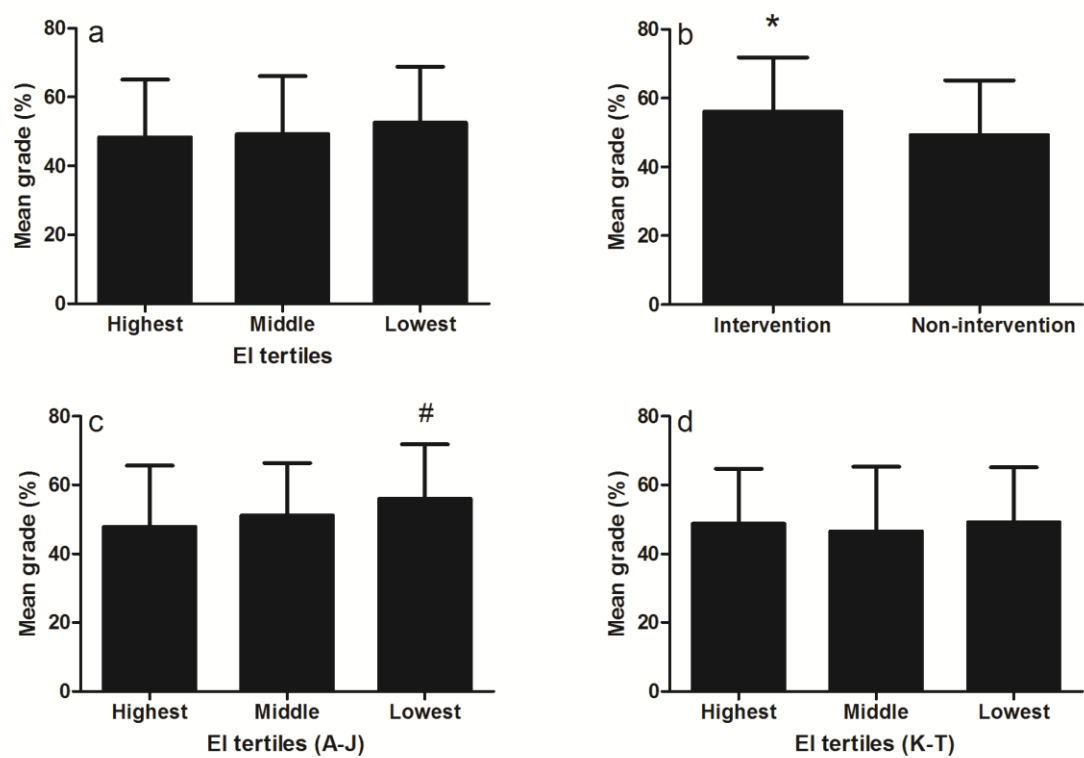
652 **Figure 1**



653

654

655 **Figure 2**



656

657

